City of Annapolis
City Dock Flood Mitigation
November 2018
Overview

- Project Objective
- Project Drainage Area
- Existing System and Tidal Flooding
- Proposed Flood Mitigation Concept Design
- Considerations
  - Filtration
  - Location
- Layout Options
- Funding and Schedule
Project Objective

Reduce flooding at City Dock by eliminating the backflow of tidal water through the storm drain system and onto the adjacent streets.

During September 2018, City Dock area experienced 12 days of flooding, closing Compromise Street temporarily on 6 of those 12 days.
Project Drainage Areas

South Pump Drainage Area (23 Acres)

North Pump Drainage Area (6 Acres)
Existing Storm Drain System

GENERAL NOTES:
1. EXISTING ABOVE GROUND STRUCTURES. PAVEMENT ALIGNMENTS, STORM DRAIN LINES, ESTATE LINES, WATER LINES AND TOPOGRAPHIC DATA ARE DERIVED FROM GIS DATA PROVIDED BY THE CITY OF ANNAPOLIS.
2. LOCATIONS OF UNDERGROUND ELECTRICAL LINES, OVERHEAD ELECTRICAL LINES, POWER POLES, GAS LINE AND COMMUNICATION LINES ARE FOR INFORMATIONAL PURPOSES ONLY, PLEASE USE A LOCATING SERVICE FOR EXACT MARKINGS.

LEGEND
MAJOR Contour...-
MINOR Contour...-
PROPERTY LINE...-
ROAD CENTERLINE...-
STORM DRAIN LINE...-
WATER PIPE...-
WATER MAIN...-
WATER STRUCTURE...-
UNDERGROUND ELECTRIC LINE...-
OVERHEAD ELECTRIC LINE...-
GAS LINE...-
URBAN STRUCTURE...-
COMMUNICATION LINE...-
POWER POLE...-
STORM DRAIN LINE TO BE REPLACED...-
STORM DRAIN WRENCH TO BE REPLACED...-
STORM DRAIN VALVE TO BE REPLACED...-
STORM DRAIN WRENCH TO BE REPLACED...-
STORM DRAIN VALVE TO BE REPLACED...-
STORM DRAIN VALVE TO BE REPLACED...-
Existing Storm Drain System During High Tide

- **Ex Bulkhead at Market Slip (Varying Elevations)**
- **Main and Prince George’s St SD Grates**
- **Compromise, Randall and Dock St SD Grates**
- **Upstream Storm Drains**
- **Open Discharge Pipe**
  - Sea water backs up in SD System (even when it’s not raining.)

Sea Level at Elevation 1.5

SD Pipes
Existing Storm Drain System During Extreme High Tide

- **Ex Bulkhead**
- **Compromise, Randall and Dock St SD Grates**
- **Main and Prince George’s St SD Grates**
- **Sea Level at Elevation 3.0**
- **SD Pipes**
- **Open Discharge Pipe**
  - Sea water backs up in SD Pipe.
  - Overflows and spills out into the street from low SD grates.
- **Upstream Storm Drains**
- **Local Flooding**
Flooding Through Storm Drains = 1.9 feet NAVD88
Extreme High Tide (2016) = 2.7 feet NAVD88
March 6, 2018
Peak EL 3.52 MLLW = EL 2.65 NAVD88
Ten Year Storm Elevation = 3.7 feet NAVD88
Base Flood Elevation (100-Yr Storm)= 5.0 feet NAVD88
Hurricane Isabel (September 2003) = 6.4 feet NAVD88
Summary of Key Elevations

Flooding Through Storm Drains – 1.9 feet NAVD88

Extreme High Tide in March 2018 – 2.7 feet NAVD88

Protection after Flood Mitigation project – 3.2 feet NAVD88

Ten Year Storm Elevation – 3.7 feet NAVD88

Base Flood Elevation (100-Yr Storm) – 5.0 feet NAVD88

Hurricane Isabel (September 2003) – 6.4 feet NAVD88
Features of Proposed Flood Mitigation System, Phase 1
Southside of Ego Alley/Compromise Street/Newman Park

– Storm Drain Improvements
  • Bypass System
  • Localized System

– Pumping Station/ Wet Well

– Control Building with Emergency Back-up Generator

– Grading Modifications (minor)
  • Newman Street Seawall
  • Handicapped Ramp tie-in at Compromise Street
Proposed Solution Schematic

New Pump Station
- Disconnects storm drain system from Market Slip and prevents sea water from backing up into street.
- Captures rain runoff and forces it out into the slip via pumps.
- All catch basins within affected area around City Dock will be repositioned and re-routed into a new collection system which will divert flow towards pump station.
- For areas outside the immediate area of concern, drainage pattern will remain the same and discharge into Market Slip.
  - Portions of the bypass storm drain system will be made water tight to withstand additional pressures.
- Check valves will be placed at the ends of the bypass systems and pump station discharges.
Proposed Storm Drain Improvements
Typical Pump Station Schematic

Image Source: Olin Studios for City of Alexandria - Waterfront Small Area Study
Filtration of Storm Water at Pump Stations

- Two critical questions regarding the addition of filtration:
  - Is filtration required by law or regulations? **NO**
  - Is filtration recommended to meet the anticipated requirements of the City’s MS4 permit expected to be issued in the near future? **NO**

- AECOM prepared the City’s Watershed Improvement Plan (WIP) and is the design engineer for the flood mitigation project.

- The WIP identified 16 cost effective projects (“low hanging fruit”) to meet the MS4 permit’s requirement to treat 20% of the city’s untreated impervious surface.

- Filtration of the storm water at City Dock is **not** the most cost effective way to meet the MS4 permit requirements.

- Filtration may be added in the future if higher MS4 requirements are imposed.
Pump Station Control Building Location

- Proposed hotel on Dock St. was considered as potential Control Building location but not selected due to uncertainty surrounding the project and its schedule.

- The Newman St. parking lot was considered but not selected due to existing low elevations, impact on waterfront viewshed and Boat Show plans for main entrance at that location. HPC indicated that they would not approve this location for the pump control building.

- HPC pre-application hearing was held on Tuesday, April 10th. HPC members unanimously recommended two site locations and building configurations as the best alternatives.

- 14 alternative site locations were considered at Newman Park.

- Many alternative building configurations were evaluated, using a building block approach.
Map of City-owned Parcels
Pump Station Control Building and Wet Well Site Plan
Newman Park – Phase 1
Phase I
Pump Station
Control Building
Newman Park Plaza

Open House will be held December 4th to discuss “re-imagining” the plaza along Compromise Street.
Grading Modifications

**Goal:** Provide consistent level of protection around Market Slip up to EL 3.2 feet.

**Dinghy Dock**
- Handicap ramp to be reconstructed 3 inches higher while maintaining ADA accessibility.
- Flooding from high tide contained within brick plaza.

**Newman Street**
- Raise approximately 100 feet of existing concrete wall from EL 1.5 feet to EL 3.2 feet.
Project Funding

– Design of Phase 1 & 2: $1 million (State funded)

– Phase 1: Compromise Street (south) side of City Dock
  • FEMA Grant - $3 million (awaiting approval of the grant)
  • City Contribution - $1.5 million
  • Funding from State - $2 million
  • TOTAL COST - $6.5 million (FY 2019 funding)

– Phase 2: Dock Street (north) side of City Dock
  • TOTAL COST - $4.5 million (currently unfunded)
Project Timeline

- Public Input – ongoing
- 2nd HPC Pre-App Meeting – April 10, 2018
- HPC Application Meeting (at 50% design) – June 2018
- Feedback from FEMA on grant application – June 2018
- Complete Design Documents – December 2018
- Construction Bidding and Project Permitting – 2018 / 2019
- Phase 1 Construction Start – March 2019
- Phase 1 Construction Completion – August 2020
- Phase 2 Construction Start & Completion – TBD
Phase I Project timeline

– Initiate Design Development – December 2017
– Public Input on concept design – completed in August 2018
– Open House for Plaza re-design – December 4, 2018
– HPC Application Public Hearing – February 12, 2019
– Approval of FEMA grant application – Unknown
– Complete Phase 1 Design Documents – September 2019
– Construction Bidding – Fall 2019
– Phase 1 Construction– January 2020 through Fall 2021
– Phase 2 Construction Start and Completion – TBD
Send Comments to:
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Project Information:
https://www.annapolis.gov/1416/City-Dock-Flood-Mitigation-Project